

REMARKS

Claims 1, 4-12 and 14-23 are pending in the subject application, of which claims 1, 18, and 22 are independent.¹ Favorable reconsideration and further examination are respectfully requested.

Claim Objections

Claims 4, 9, and 15 were apparently objected to as referring to a subsequent claim. We have amended claims 4, 9, and 15 to each depend from claim 1. Accordingly, we respectfully request that the objections be withdrawn.

Claim Rejections under 35 U.S.C. § 102

Claims 1-4, 6-12, 15, 17-19, and 21 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,982,601 (Lin).

Independent claim 1 is shown below.

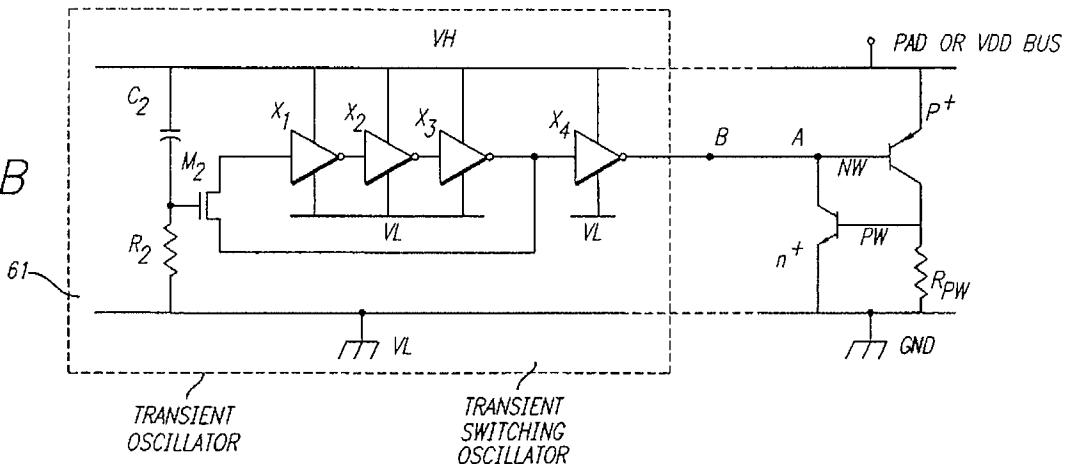
1. A circuit arrangement for protecting an integrated semiconductor circuit comprising:
a protection circuit located between an element to be protected and a reference potential, the protection circuit comprising a thyristor structure that includes active elements; and
a control circuit configured to drive the protection circuit by generating a plurality of control signals to drive one or more active elements of the protection circuit, the control circuit comprising:
 - a detector circuit in parallel with the protection circuit;
 - a first resistive-capacitive (RC) element, the first RC element comprising a resistor and a capacitor;
 - an additional circuit arranged downstream from the detector circuit;
 - a driver circuit that couples the additional circuit to the thyristor; and
 - a second RC element comprising a second resistor and a second capacitor, the second RC element being electrically connected to a connecting point between the additional circuit and the driver circuit.

¹ The Examiner is urged to independently verify this recitation of the pending claims.

The applied art is not understood to describe or to suggest at least the underlined features of claim 1 above.

More specifically, Lin is understood to disclose a electrostatic discharge (ESD) protection structure for an integrated circuit.² As shown in figure 6B of Lin (reproduced below), an NMOSFET M_2 is used as a transient switch.³

FIG. 6B



The gate of M_2 is coupled to VH through a capacitor C_2 , and coupled to VL through a resistor R_2 .⁴ This circuit drives a serial connection of voltage inverting gates, which in turn drives semiconductor controlled rectifiers (SCR) which are used as ESD protection devices.⁵ These features of Lin are distinguishable from claim 1, which recites a control circuit comprising a *second RC element* comprising a second resistor and a second capacitor, the second RC element being electrically connected to a connecting point between the additional circuit and the driver circuit.

² Lin, Abstract.

³ Id., col. 4, lines 8-9.

⁴ Id., col. 4, lines 9-10.

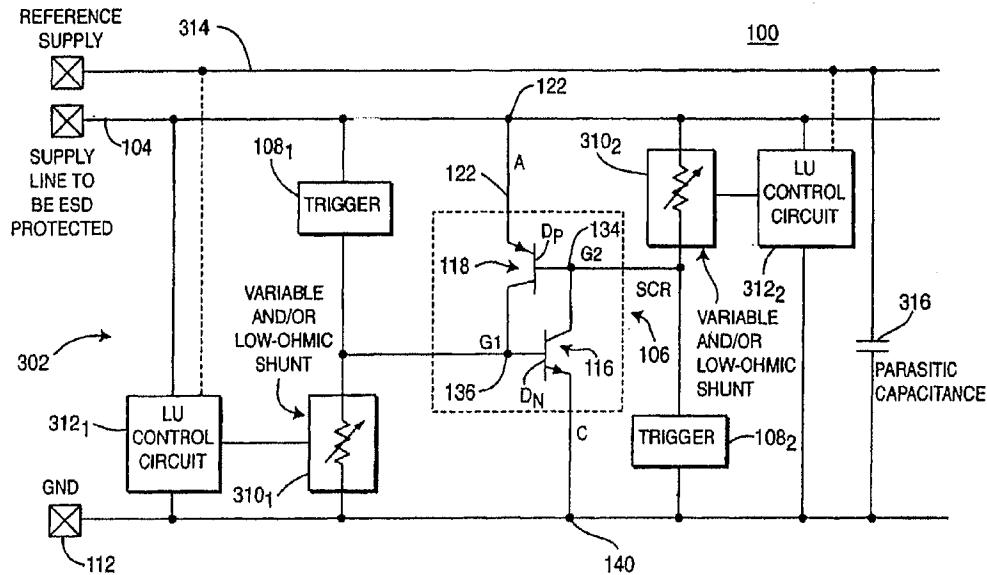
⁵ Id. See also, FIG. 6C.

As described above, claim 1 recites a control circuit that comprises a second RC element. While Lin discloses a circuit that includes a first RC element for driving a protection circuit, Lin fails to describe or to suggest the presence of a second RC element, much less a second RC element being electrically connected to a connecting point between the additional circuit and the driver circuit. Thus, for at least the foregoing reasons, claim 1 is believed to be patentable over Lin.

Claims 1-3, 5, and 16 were rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,803,633 (Mergens). Mergens fails to describe or suggest the same underlined features of claim 1 above.

More specifically, Mergens is understood to disclose an electrostatic discharge (ESD) protection device formed in a semiconductor integrated circuit (IC) having protected circuitry.⁶ As shown in figure 3 of Mergens (reproduced below), Mergens appears to disclose that the ESD protection device includes a silicon controlled rectifier (SCR) coupled between a protected supply line of the IC and ground.

⁶ Mergens, Abstract.



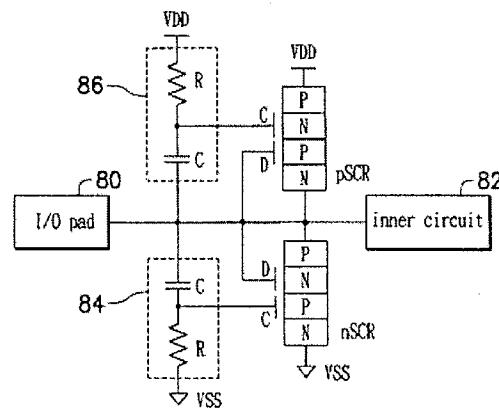
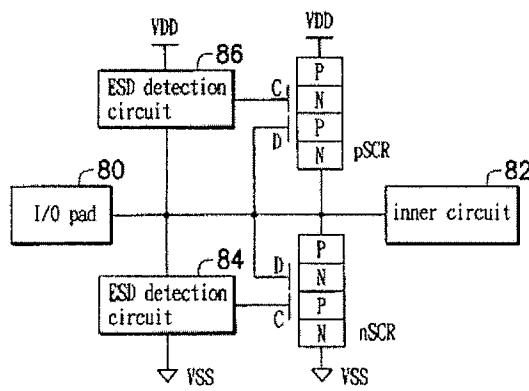
Both first and second trigger devices 108₁ and 108₂ and the low resistance shunt resistors 110₁ and 110₂ are respectively coupled to the first and second gates 136 and 134 of the SCR 106.

These features of Mergens are distinguishable from claim 1, which recites a control circuit comprising *a second RC element* comprising a second resistor and a second capacitor, the second RC element being electrically connected to a connecting point between the additional circuit and the driver circuit.

Mergens fails to describe or to suggest the presence of a first RC element, much less a second RC element being electrically connected to a connecting point between the additional circuit and the driver circuit. Thus, for at least the foregoing reasons, claim 1 is believed to be patentable over Mergens.

Furthermore, U.S. Patent No 6, 465,848 (Ker) does not cure the foregoing deficiencies of either Lin or Mergens. More specifically, Ker is understood to disclose an ESD protection device having a lateral SCR structure with two electrodes and a MOS for triggering the lateral

SCR.⁷ As shown in figures 6a and 6b of Ker (reproduced below), Ker discloses two ESD protection circuits, where one is applied between the I/O pad and VSS and the other is applied between VDD and the I/O pad.⁸



The ESD protection circuit between the I/O pad 80 and VDD includes an ESD detection circuit 86 and a PSCR.⁹ The anode of the PSCR is coupled to VDD. The dummy gate and the cathode of the pSCR are coupled to the I/O pad 80.¹⁰ The ESD detection circuit 86 is responsible for driving the control gate of the PSCR.¹¹

⁷ Ker, Abstract.

⁸ *Id.*, col. 4, lines 36-54 (emphasis supplied).

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

FIG. 6b of Ker is an embodiment of FIG. 6a.¹² The ESD detection circuit 86 is composed of a resistor and a capacitor connected in series.¹³ The control gate of the pSCR is coupled to the connection node between the resistor and the capacitor in the ESD detection circuit 86.¹⁴

These features of Mergens are distinguishable from claim 1, which recites a control circuit comprising a second RC element comprising a second resistor and a second capacitor, *where the control circuit is configured to drive the protection circuit.*

While Ker discloses an embodiment containing two ESD detection circuits each containing an RC element, Ker fails to describe or to suggest a control circuit comprising a second RC element, where the control circuit is configured to drive the protection circuit. In contrast, Ker discloses that two ESD detection circuits each contain a resistor and a capacitor connected in series, and that each ESD detection circuit drives a separate SCR circuit (i.e., pSCR and nSCR). Claim 1 recites that the control circuit comprises a first and second RC element, and that the control circuit drives a protection circuit. Accordingly, for at least the foregoing reasons, claim 1 is believed to be patentable over any reasonable combination of Lin, Mergens, and Ker.

Independent claim 18 contains features that are similar to those described above with regard to claim 1, and is believed to be patentable for at least the same reasons discussed above with regard to claim 1.

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

Applicant : Bernd Deutschmann, et al.
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Page : 15 of 15

Attorney's Docket No.: 14603-0026US1 / P2004, 0133
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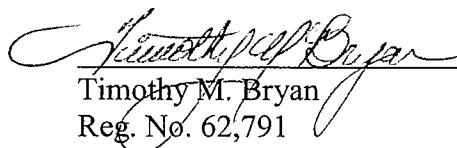
Dependent claims are believed to define patentable features. Each dependent claim partakes in the novelty of its corresponding independent claim and, as such, the dependent claims have not been discussed specifically herein.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The fee for a two month extension of time is being paid herewith via deposit account authorization. Please apply any other charges or credits to Deposit Account 06-1050, referencing Attorney Docket No. 14603-0026US1 / P2004, 0133 US N.

Respectfully submitted,

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